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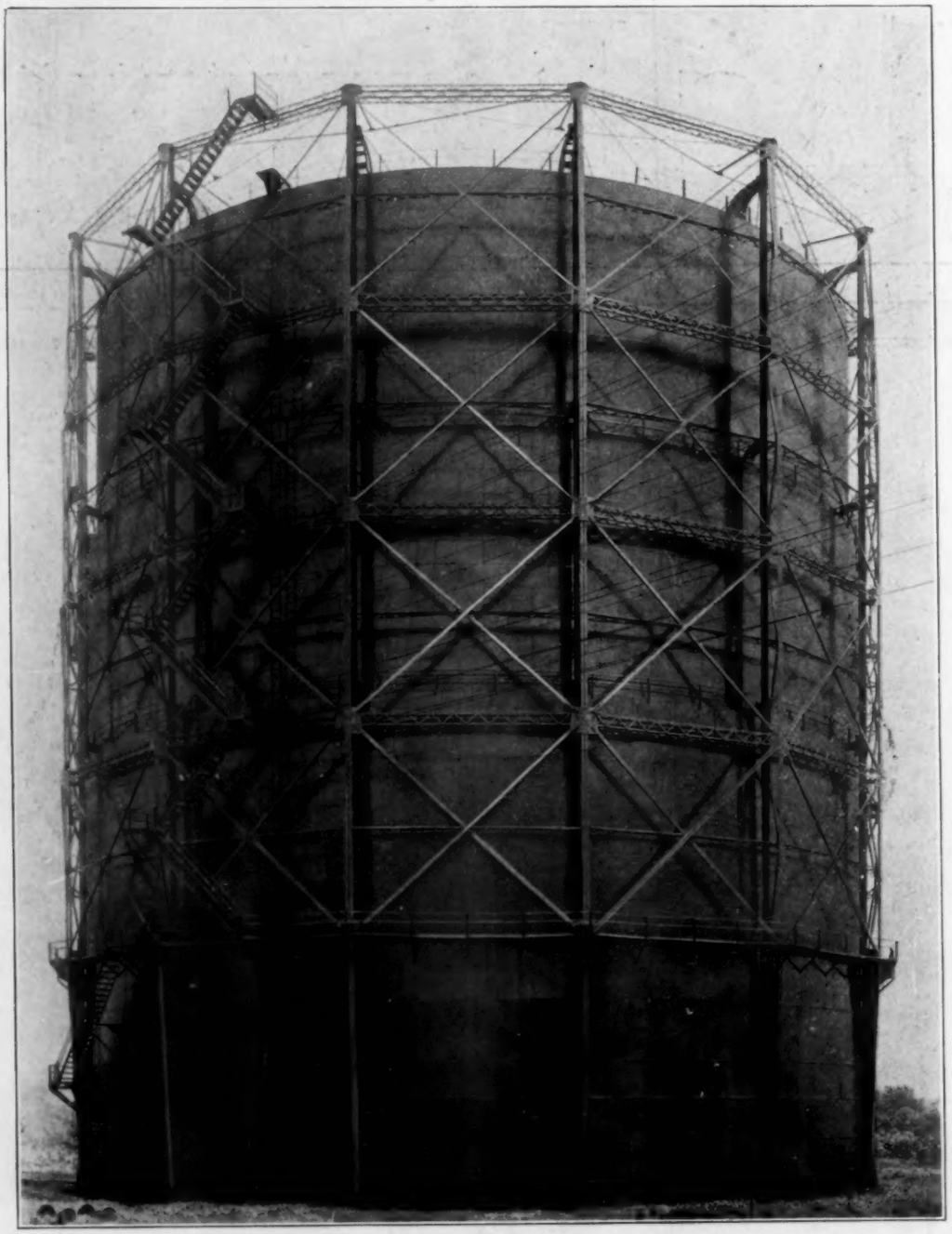

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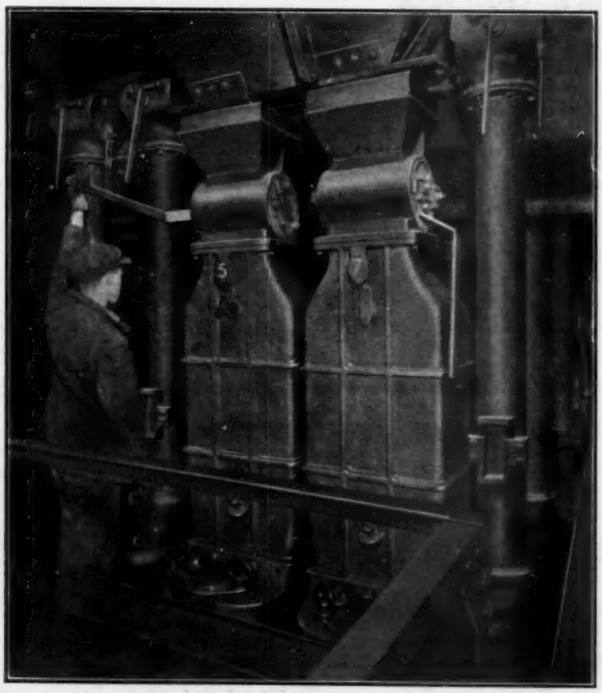

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Carbonization as a Heat Distributing Problem

Three Methods of Securing Even Heating Suggest Themselves

By O. C. CLISHAM

The process of carbonization is essentially the application of heat to a charge of gas coal. In order to conserve the desired products we conduct the process in a closed vessel, to the outside of which the heat is applied. In the present state of gas making, the carbonizing temperature must be that of a red heat, at least, which requires a refractory container. Experience early showed that, for good results, this heat must be evenly distributed, or at least evenly graduated. At present the only economical source of heat for such a process is a gaseous flame, using that word to include the combustion products of any customary fuel. The fundamental problem of carbonization, then, is to apply a flame, or group of flames, to a refractory wall so as to heat it evenly to at least a red heat over considerable areas.

We are of the opinion that the gas fraternity will find much of interest in this article and that it will arouse quite some discussion. The writer has handled his subject well, and advances well-thought-out arguments.—Editor.

In endeavoring to secure even heating three modes of procedure suggest themselves, and in fact these methods are exemplified, to a large extent, in three corresponding general types of modern carbonizing apparatus which are, however, not usually classified on that basis. For convenience we may term these three types of heating (1) multiple flame, represented by vertical-flue coke ovens and horizontal retort benches, (2) indirect flame, represented by certain vertical retort settings, in which the fuel gas is completely burned in a combustion chamber, out of direct contact with the carbonizing surface, i. e., the retorts, and (3) long flame, represented by horizontal flue ovens. These terms are chosen in the belief that they are descriptive, but to avoid possible misunderstandings or animadversions resulting from too absolute interpretations of the words as customarily used, their intended meanings will be illustrated.

Of course, all three principles of heat distribution are combined, in varying proportions, in any carbonizing apparatus that was ever built. No unit is ever heated with an absolutely single flame although some vertical benches approach that condition very closely; none has the actual gaseous flame mantle in direct contact with the entire carbonizing surface at all times; and none uses a flame of zero length, though here, too, the vertical bench avoids the consequences of this fact by separating the flame production from the carbonization, as aforesaid. The terms are to be understood only relatively. The vertical flue oven, for example, depends for its heat distribution mainly on having a relatively large number of heating flames under control. Certain vertical settings accomplish this result mainly by conducting the regulated complete combustion of producer gas in a combustion chamber, and then bathing the retorts in the homogeneous products of combustion. The horizontal flue oven, by means to be described, effects a gradual combustion of fuel gas in contact with substantially the entire carbonizing surface, which merits the name of long-flame combustion, at least in comparison with that occurring in other types of apparatus. These illustrations may perhaps serve to emphasize the purely relative nature of the proposed classification.

MAY 4 1922

Multiple Flame Characteristics

It is fairly obvious that every individual flame requires a certain amount of supervisory attention from the operator. If producer gas is the fuel, dust accumulates in the combustion nozzles, and coal gas causes similar trouble by its carbon deposits. Hence the routine of poking, swabbing, or burning out, with which we are all only too familiar. What is not quite so obvious, perhaps, is that increasing the number of independent flames, for purposes of distribution, results in increasing the necessary supervisory work out of all proportion to the numerical increase of

burners. That is, for example, two burners, on the same gas manifold would be more than twice as bothersome to keep regulated as a single flame would be.

The reason for this is inherent in the multiple or parallel system of distribution. In order to grasp the principle, let us take the simplest possible case, and consider the difference in action between a single burner and two, connected in parallel. Imagine a bench of retorts, for example, heated by a single gas flame. Now a partial stoppage of the orifice, nozzle, valve, or whatever controls the admission of fuel gas to the flame, would affect the heating of the bench, to be sure, but the effect would be a uniform one, not tending to produce underheating in one part of the bench and overheating in another. Moreover, with only one avenue of escape, the fuel gas would tend to build up pressure as the single opening became constricted, thus automatically correcting slight stoppages. If, on the other hand, the bench were heated by two burners supplied by a common gas manifold, a stoppage of one burner, however slight, would mean not only less gas through the stopped burner but more gas through the other one. The partially stopped burner would then have slower gas travel through the orifice and would tend to plug up faster than the other, and so the condition of uneven distribution, however slight in the beginning, would accentuate itself if not artificially corrected. Without dragging out this argument to tiresome length, it can be seen that the more burners in parallel connection, the more this unbalancing tendency is multiplied. Anyone who has attempted to conduct gas in equal amounts through two or more ammonia washers in parallel will need no convincing as to the difficulty of such operations. One would be tempted to estimate that the unbalancing tendency is more nearly proportional to the square of the number of units involved than to the number itself. Similarly, in retort benches, etc., heated by a plurality of gas flames in multiple connection, every obstruction in the burner passages produces underheating in its immediate neighborhood and overheating in one or more other places.

To gasmen, perhaps the most familiar application of multiple-flame heating is the horizontal retort bench. In some makes of setting the size of each gas opening can be varied by means of sliding tiles or nostril bricks. By means of daily cleaning with iron rods and adjustment of the sliding bricks the retorts can be heated evenly from front to back, with the temperature "tapered" off toward the gas take-off end. This is fussy and arduous work and must be done, a little at a time, every day in the year, under the direction of an intelligent and experienced person, to get the desired results. In settings where the gas openings are non-adjustable, or where this sort of work is neglected or omitted the heat distribution is something awful to contemplate, as anyone can testify who has been around much on trips of inspection which have included some of the more obscure and poorly operated installations. Who cannot recall the retort house where, on being asked for a "look at the heats," the foreman, after numerous trials, finally found a peephole which could be reamed out, and upon applying your right eye to it, you were partially blinded by the white streak near the front, and forcibly reminded of an introverted zebra by the general view? You may also recollect that in the condenser house each condenser had its own permanently attached steam hose, as a single one could never have transferred around fast enough to keep the system free of naphthalene stoppages.

Extended Application of Multiple-Flame Principle

The most extended application of the multiple-flame principle is found in the vertical-flue coke oven. (In the Koppers oven, for example, there are thirty gas flames to each oven, half burning at a time, with thirty additional required to complete each block.) The heat ditsribution in this type of construction calls for a series of gas-regulating ports or nozzles, which, in the most successful installations, are accessible for inspection and cleaning. The importance of this work has been recognized by both designers and operators of these ovens, in a manner which many retort house superintendents could emulate with considerable profit. Men of no mean intelligence are assigned to this duty, and the top of a vertical-flue oven block is seldom visited without seeing one or more of these "heaters" at work, punching out nozzles or replacing them with remarkably ingenious tools, adapted for reaching the bottom of the hot flues where the nozzles are set.

Various groupings of the vertical flues are found in the numerous makes of ovens, some with one division wall only, some with four groups on each reversing half, and some in which the burned products return down each immediately adjacent flue, but as far as our main problem of heat distribution is concerned, they all depend on a plurality of parallel flames, kept equal by design of gas ports, aided by unremitting, intelligent attention.

Indirect Flame Characteristics

In the preceding argument, the distributional advantages of a single flame were pointed out, as opposed to a plurality of flames in parallel connection. Considering a bench of vertical retorts as a unit, this system applies to all the retorts in the bench what is, to all intents and purposes, a single flame. Of course, the producer gas may, and often does enter the combustion chamber through more than one opening, and the same applies to the air. But the combustion is substantially complete and the burnt products fairly well mixed before they come in contact with the carbonizing surface proper, practically as much so, in fact, as if they were indeed the products of a single flame. The entire bench must partake of any temperature change due to the operation of the heating system. Consequently such changes are gradual and predictable, hence preventable. There need be none of the minute-to-minute local heating inequalities of the naphthalene-breeding sort caused, for example, by a plugged nostril in a horizontal bench.

This system is obviously best suited to a tall, vertical structure, and is moreover limited to a gas of relatively low flame temperature, such as producer gas. To burn coal gas or blue water gas to exactly complete combustion under an arch would probably tax the strength of most refractories, and in the former case would unquestionably lead to uneconomical cracking and deposits of carbon.

(*Continued on page* 398.)

Analyze Rate Situation

A Summary That Gives Much Valuable Information

A summary of the gas rate situation throughout the United States, with particular reference to Indiana conditions, and comprising a condensation of answers to questionnaires from dozens of gas companies, is to be presented to the annual meeting of the Indiana Gas Association at French Lick, Ind., in May. A special committee appointed by the gas association, and working in co-operation with Earl Carter, chief engineer of the Public Service Commission of Indiana, has just completed the report. What action the Indiana association will take in the matter is not known, of course, but that the summary will work at least for a basis toward which the thoughts of gasmen in the Central Western States will be turning more and more seems certain.

The report which is presented here is very complete and will bear studying by any executive who is confronted with the problem of rate changes. The underlying data are such that they are applicable to any State.—Editor.

The report delves into the question of whether the service charge should be applied, and draws several very interesting conclusions. One of the salient points it brings out, showing definitely that some additional part of the ready-to-serve burden should be put on the smaller consumer of gas, is that 81 per cent of typical gas consumers in Indiana use between 0 and 5,000 cu. ft. of gas a month. The charges for delivering this small amount of gas to the consumer are now, in practically all cases, exactly the same as the charges for delivering millions of cubic feet to a larger consumer. It is obvious that such a condition of affairs is discriminatory.

The report is to be signed by B. H. Gardner, of the Northern Indiana Gas & Electric Company, of Lafayette, as chairman of the special committee; F. B. Tracey, of the Central Indiana Gas Company, of Muncie; J. D. Forrest, of the Citizens Gas Company, of Indianapolis; E. E. Clay, of the Columbus Gas Light Company, of Columbus, Ind., and E. Van Arsdel, of the Interstate Public Service Company, of Indianapolis.

The report in full, as made public for the readers of the AMERICAN GAS JOURNAL, follows:

The Report

There is probably no question before the gas companies of the country to-day that is more important than the question of rates. Generally speaking, the communities served are not satisfied with the rates in effect and are expecting adjustments of some kind. Everyone in the business realizes that there can be no general reductions in rates until costs are reduced to a greater extent and until there has been a stabilization of these costs. We must reach a point where we can reasonably foretell what next month's costs will be. That such a condition will eventually be reached no one can doubt. This, then, is a time when the rate question should be studied as never before, and when definite principles should be agreed upon and plans made for the future.

In the past too many gas companies have been satisfied if their income exceeded their outgo by a small margin, and have given no thought to the question as to the form of rate under which the income was obtained. They have not worried about the question of whether their rate forms were fair as between customers of various classes, or whether they were properly designed so as to result in the maximum development of the business. The gas companies can hardly claim to be fulfilling their true function until they are serving all the business that economically belongs to them. The industry can never hope to reach this condition with a rate schedule that is illogical or that does not properly apportion costs between the various classes of customers.

It would seem that any rate schedule should meet the following tests:

1. Is it fair as between customers?
2. Will it give the maximum development of the business?
3. Is the principle one that can be sold to the public and that will be upheld by the commissions and courts?

The type of rate that is almost universally used in the gas business to-day is the block rate, such as: First 10,000 cu. ft. per month, $1.50 per thousand, etc.

A rate of this kind is not fair as between customers; on the contrary, it is discrimination of the rankest kind.

One of the best contributions that have been made in a long time to the subject of gas rates is a paper by F. C. Freeman, of the Providence Gas Company, of Providence, R. I., and entitled, "Analysis of Costs, Applicable to a Service Charge." In this paper Mr. Freeman analyzes the costs to the Providence company of

supplying their various classes of customers, based on conditions during 1920. While the costs set forth are applicable to Providence, there is little question but that a complete analysis of the costs of any gas company would show very similar conditions, and costs that would not vary greatly from Providence costs. Mr. Freeman found that the real cost to the company of supplying the smallest class of customers—namely, those using less than 400 cu. ft. per month—amounted to $17.40 per year, or approximately $1.50 per month, exclusive of the cost of gas actually delivered. His analysis also showed that the cost of gas service for various classes of customers varied as follows:

Class of Consumers Based on Consumption per Month	Net Cost per M Delivered to Customer
0 to 400	$6.75
400 to 1,000	2.66
1,000 to 2,000	1.73
2,000 to 3,000	1.47
3,000 to 4,000	1.34
4,000 to 5,000	1.26
5,000 to 10,000	1.20
10,000 to 100,000	1.04
Over 100,000	0.87

As the majority of gas companies have a rate schedue which provides the same rate for consumption from 0 to 10,000 cu. ft. per month, they present the spectacle of a great industry attempting to market its product at an average price, where the cost actually varies between $1.20 and $6.75 per thousand. Such a sales policy is certainly not equitable as between customers, nor is it calculated to result in the maximum development of the business. No one who has ever made a serious study of the average block gas rate has ever claimed that such a rate is fair.

Many Items of Expense

The reason for the great variation in the cost of supplying gas service is, of course, due to the fact that there are many items of expense, such as reading meters, bookkeeping, collections, miscellaneous office expenses, customers' premises expenses, maintenance of mains, service and meters, and interest and depreciation on services and meters, that are more or less fixed and that go on regardless of whether gas is used or not. If the consumption is small, these items of expense are high per thousand; and, conversely, if the consumption is large, these items of expense are low per thousand.

It costs no less to read the meter, post the account and make out a bill for 500 cu. ft. than for 25,000 cu. ft., and at least a large portion of the investment and maintenance charges are not far different for the two customers. If the gas business were such that it were possible for each customer to come to the gas works each day and take away his supply of gas, it would be practicable to sell the gas all on the same basis and at the same rate. Where, however, the gas company is forced to undertake the delivery of the gas to any point, at any time, and in any quantity, and is required to maintain that supply at all times, and further forced to account for the delivery to each customer each month, then the problem becomes more involved.

Retards Development of Business

Many companies have recognized the fact that there are many items of expense that have no relation to the amount of gas delivered and that to attempt to charge an average price for gas results in discrimination as between customers and retards the development of the business. Many of these companies have attempted to correct the difficulty by the introduction of a service charge of one kind or another. There are really two methods of applying a service charge. The more general way is a straight service charge, independent of the gas used, which results in a rate such as: Service charge, 75 cents per month; charge for gas, first 5,000 cu. ft., $1.25 per thousand.

Another way in which a service charge may be applied is by making a relatively high charge for a very limited amount of gas, such as: First 200 cu. ft., $1; next 4,800 cu. ft., $1.25, per thousand.

While these rates may seem quite different at first glance, the second rate will give practically the same revenue as the first rate, the only customers whose bills would vary under the two rates being those having no consumption or a consumption of 100 cu. ft. per month. It will be noted that in the second rate the charge of $1 can be considered as being made up of a service charge of 75 cents plus 200 cu. ft. at the rate of $1.25 per thousand.

The principle of a service charge in some form or otheh has been well established. The greatest objection has, of course, come from those whose bills have been increased by such charges. These have generally been the smallest customers, the very ones who have been paying less than they should ever since the gas industry was first established. Probably few of them realized that this was the case, and therefore it is no wonder that they have complained when they have been requested to pay a little more toward their fair share of costs.

Some Decisions

The following extracts from commissions' decisions relative to a service charge are of interest.

In the Ashtabula Gas Company case the Ohio Public Utilities Commission said:

> There is a certain amount which the public must pay to enable the utility to operate. If a portion of it is paid in a readiness-to-serve charge, that much less is necessary to be produced from the sale of gas. The readiness-to-serve charge does not yield the company any greater sum, nor cost the consumer any more money. It results only in a different distribution of the burden.

In the case involving the electric rates of the Lockport Light, Heat & Power Company, the New York Public Service Commission for the Second District said:

> The principal attack was made on the service charge for residence lighting. It was argued that the small consumer was made to pay more than a fair amount for his electricity and that there was no justification for such a charge. Because an increase is made in the amount that the small consumer has paid in the past, due to the fact that he has not been paying his fair share of the burden incident to his service, is no reason why he should

get that service at the expense of the other consumers who use a larger quantity of electricity. We have never seen any plausible explanation of the theory that the consumers of small quantities of electricity should be supplied at less than the cost to the company serving him. As a matter of fact, such a claim cannot be successfully defended. It is argued that the service charge raises the rate of the small consumer who is least able to pay and lowers that of the larger consumer who is presumably in better financial circumstances; yet we will not presume to, nor does the law requires us to, compel a company supplying electricity to furnish it to the small consumer at less than cost and at the expense of those who may be better able to pay, and yet this is the inevitable result if electricity is sold for residence lighting purposes on a flat kilowatt-hour basis.

In City of Hartford vs. Hartford City Gas Light Company, the Connecticut Public Utilities Commission quoted the findings of many other commissions in upholding the service charge, and held:

> In line with these numerous decisions this commission is of opinion and finds that the installation of a readiness-to-serve or customer charge by the respondent as a means of increasing its necessary revenue and as an element in its rate structure is not improper or inequitable.

The Pennsylvania Public Service Commission, in Sellersville vs. Highland Gas Company, said:

> It is a popular error to say that a readiness-to-serve charge requires consumers to pay for that which they do not receive. This is a wholly fallacious conception. Such charges are based upon the fact that the plant must be kept in a condition to render immediate service to each of its patrons, whether he draws upon it or not. It costs the company money to be ready at all times to render such service, for a supply of gas must be kept in the mains and pipes to the consumers' business, ready for his immediate and instant use when he desires it and notwithstanding he may not light it at all. In some respects it is comparable to the telephone which a patron has installed in house or office, ready to transmit messages, whether it is actually used by the patrons or not, and also to the charge for a taxicab or automobile which a patron may hold awaiting his use while on visits to store, house or office. If such charges are not imposed by the rate boards in the forms of a ready-to-serve charge they must of necessity appear in some other form, for the gross amount which any company is permitted to obtain from its patrons is made up of two elements of service actually rendered them, "ready-to-serve" and "consumption." If the readiness-to-serve charge is lowered, the consumption charge must be raised; and if the readiness-to-serve is eliminated as separate item, then it will be necessary to include this cost in some other form.
>
> Readiness-to-serve includes those items of expense of keeping the gas or water in the pipes ready to be used, and the consumption charge begins where this readiness-to-serve expense ends, and the two together make up the proper charge to the consumer, whether presented in one figure or separated into two elements.

The New Jersey Board of Public Utility Commissions, in Ocean County Gas Company, said:

> If they are not paid by the customer to whose sole use they are devoted, some other customer or customers must be charged with this cost, or the company must fail to receive reimbursement for such expenditures. Failure to recognize this fact tends to introduce an element of discrimination in rates unless each and every customer uses his service pipe and meter for approximately the same number of months of each year.

The New Jersey Board of Public Utility Commissioners, in Hackensack Water Company, said:

> The costs for domestic, industrial and public consumers should be met by (1) a fixed service charge, payable whether water is taken or not, and (2) a charge covering proportional or variable costs apportioned on the basis of the quantity of water consumed.

The New Hampshire Commission, in Kinch vs. Concord Light & Power Company, said:

> The service or readiness-to-serve charge is generally regarded by students of utility rates as preferable to the minimum charge, but there is a wide difference of opinion as to how much of the fixed costs should be included in the service charge. . . .
>
> The best and fairest way to secure such responsibility on the part of every customer is by the use of a service charge which shall be only sufficient to make sure that no individual consumer is served at an actual loss, in out-of-pocket expense to the company. . . .
>
> Objection is made to a service charge that it increases the cost of the small user out of proportion to the increase to the large user. This must be true of any just increase when the small user is not paying a fair proportion of the cost.

The Rochester Decision

In the case of the City of Rochester vs. Rochester Gas & Electric Corporation, a case involving the validity of the service charge and which has been decided by the Court of Appeals of New York (the highest court in that State) since the first of the year, the court says:

> The expenses of a gas company are incurred partly in manufacture and partly in distribution. Its income must be adequate to reimburse it for the one outlay as for the other. Expenses of manufacture may be apportioned among consumers in proportion to the quantity of gas consumed. Expenses of distribution in their division may follow other lines. Some remain constant whether consumers are few or many. Others increase or diminish at a uniform rate with the number of the patrons. A service charge is an attempt to make the incidence of the burden as wide as the incidence of the benefit.
>
> From all the items included in the cost of distribution it segregates and divides per capita those de-

pendent upon numbers. Such items there always are. Whenever a building is connected with a main there is expense which continues while the connection is maintained. This expense will be the same though only a trifling quantity of gas, or even none at all, is used by the householder requiring the connection. In the absence of a service charge or some similar device there is the benefit of facilities, which would otherwise be needless, without the burden of contributing to the cost of supplying or maintaining them. The householder who closes his dwelling for the summer and pays nothing in the interval shifts the cost of maintenance incurred in his behalf to the householder whose dwelling is open throughout the year. The occupant who consumes something, but not enough to pay his share of the expense, is carried by his neighbors when rates are increased to compensate for profitless accounts. Sometimes this result is avoided through the device of a minimum bill, which differs from a service charge in this only: that the charge is absorbed and disappears when the minimum is reached. For the man who does not take anything, or less than the amount prescribed, the two devices are the same. Each is an expedient for maintaining the equilibrium between service and requital . . . We are told that the plaintiff, being a public service corporation, is bound to serve, and that since it is bound to serve it may not charge inactive accounts for maintaining facilities for service. The conclusion does not follow from the premise. The law imposes the duty to establish connections for the householder who demands them, but it does not impose the duty either to install or to maintain gratuitously. No one is under an obligation to permit connections to be made between his building and the mains. If he demands the facilities, with the added expense that follows, he thereby invites a service, and must be numbered among those for whom service is maintained. The Legislature has nowhere said that benefit shall be divorced from burden. On the contrary, permission is expressly given to assess upon the householder the entire cost of installing service pipes beyond the street line, and to demand a deposit in advance sufficient to pay therefor. If there is a right to require payment for installation, there must be a right to require payment for repairs. If there is a right to insist upon payment in lump sum, there must be a right to distribute the payment in accordance with the monthly average of cost. Even if installation were at the cost of the company alone, this would not mean that a return upon the cost would cease to be a factor in the computation of the charge for service. The burden of maintaining the agencies of distribution is to be apportioned among the total body of patrons for whose benefit the agencies exist. No doubt it is to be apportioned fairly and reasonably. But if that requirement is satisfied, it is not a ground for complaint that each has been required to contribute his share of the expense. A service charge is not something in addition to the price that would otherwise be fair and reasonable. It enters into the price of the commodity not as an element of addition but as an item of deduction. In the case at hand the finding is that if the service charge were dropped, the price of gas, now $1.30 per thousand cubic feet, would become $1.45. The revenues of the company are the same whether rates are computed on the one basis or the other. The variance is solely in the distribution of the burden . . . Formal equality there indisputably is. The service charge is imposed not on some only but on all, and on all at the same rate. Discrimination, if it exists, must inhere in remoter incidents or consequences. We start with the recognition of the truth that perfect equality in operation as well as in form is not to be attained by any scheme of rates. Classification is not forbidden, if founded upon reason and not upon caprice or favor. There are those who think that a schedule which does not impose a service charge is discriminatory, since it shifts upon some consumers the burden of carrying the others. Occasional hardships there will be with any plan. It is a question largely of degree. The argument against the charge seems to rest upon the assumption that unjust discrimination inheres in every rate that is not a flat or uniform rate for every foot of gas supplied. The scale of charges must not be graduated, it is said, so as to adapt the payment to the cost. But that has never been the rule of rate making for public service corporations . . . With these provisions in force, we see no escape from the conclusion that a service charge, reasonably computed and moderate in amount, does not involve *per se* an illegitimate discrimination between classes of consumers. . . . The conclusion thus reached is confirmed with impressive force by the judgments of courts and commissions in other jurisdictions. Service charges have been sustained by the courts of Louisiana and Rhode Island. They have been sustained by public utilities boards in thirty-eight States. A joint conference committee appointed by the New York Public Service Commission has recommended the adoption either of service charges or of some analogous expedient in New York. Such commissions as have disapproved the charge have put their rulings upon grounds not of power but of expediency. The result is a body of expert opinion which may not lightly be disregarded when classification is assailed as making an arbitrary preference.

Decisions Quoted Are Typical

The decisions quoted above are typical and might be multiplied by many times. As a matter of fact, the principle of the service charge has been upheld by practically every commission in the country, by many courts and by the supreme courts of at least three States. In spite of this, however, the straight service charge has proven very unpopular in almost every locality where it has been introduced. The very fact that it has figured in so many commission and court decisions is an evidence that the people generally have not cheerfully accepted it. Your committee has attempted to find out the present feeling of the gas companies that have been using the service charge in their rates, and wrote to a large number of them. Replies were received from forty-one companies located in sixteen different States and scattered from the Atlantic to the Pacific. The replies almost without exception bore testimony to the fact that the straight service charge has proven very unpopular, and had resulted in protests and, in many cases, in appeals to the commission or to the courts. The replies indicated that many companies had already given up or were about to give up the service charge—the step

being taken merely to placate the public and remove a source of misunderstanding. Some of the companies were changing back to the old ordinary form of block rate, which seems most unfortunate. Most of the companies that had changed, however, had introduced a new rate with a very high charge for the first few hundred cubic feet of gas. This is very nearly equivalent to a service charge, as pointed out above. One company reported a rate of this kind as high as $1.35 for the first 100 cu. ft. The companies that had originally introduced a rate of this kind, as well as the companies that had given up a straight service charge rate in favor of the new form, both reported that the introduction of such a rate had resulted in little or no complaint, and that their customers apparently were satisfied to pay a relatively high rate for a small quantity of gas. From the evidence at hand it would seem that a rate of this kind will prove highly satisfactory to the customers and at the same time will result in a far more equitable division of the costs of service than the ordinary form of block rate.

The Three-Charge Rate

In considering the question of rates it is well to bear in mind the possibilities of the three-charge rate, especially for industrial service. It is not believed that the time is ripe to consider the introduction of such a rate for general domestic use for two reasons. In the first place, it will be unpopular with the great majority of the customers, and in the second place, due to the necessity for the installation of demand-limiting devices, it will greatly increase the investment and operating expenses of the company. For a limited number of large industrial customers, however, the three-charge rate has great possibilities, but each company will have to study its own situation to determine the advisability of such a form of rate.

There is one feature in connection with a rate containing any kind of a service or fixed charge that is worthy of serious consideration. The greater the part of the total bill that is taken care of by a fixed charge, the smaller that will have to be covered by the commodity charge, and hence the lower the commodity rate can be. The lower the commodity rate, the smaller the variation in the size of the bill from month to month. The general experience has been that people complain about high bills, not so much on account of the size of the bill itself as on account of the fact that that particular bill is larger than some preceding bill that the customer has in mind. For instance, a customer complains about the size of the bill for January, because he remembers paying much smaller bills during previous months, which bills may have covered the summer months when the use of service was quite different. When a part of the total charge is taken care of by a fixed amount, the variation from month to month is minimized. It is the testimony of practically all companies that have used a rate with a fixed charge of any kind that the high-bill complaints were greatly reduced. Some companies have even stated that a rate of this kind eliminated 90 per cent of high-bill complaints. Surely such a result is worth striving for.

We have attempted to collect some data relative to the gas business in Indiana that should prove of interest. A questionnaire was sent out to all the members of the Indiana Gas Association asking that certain information be compiled and sent in. Most of the companies responded, and the information collected is presented in this report. Probably the data given will surprise many. It will be noted that twenty-five companies, with a total of 105,200 customers, reported full information. Averaging the data from such companies shows the following facts:

Customers using—	Per Cent of Customers	Net Mo. Cost, Present Rate
0 to 1,000 cu. ft. per mo...	25.2	$1.04
0 to 2,000 cu. ft. per mo...	60.2	1.70
0 to 3,000 cu. ft. per mo...	81.2	2.17

When a charge is made that the gas rates in Indiana are high, it is well to know that 81 per cent of the gas users of the State use less than 3,000 cu. ft. of gas per month, with a resultant average bill of only $2.17 per month. This is only 7 cents per day. Compare what the gas customer gets for this 7 cents with some of the other things for which he spends an equal amount. It is hard to realize that a company can perform all the service that a gas company does perform for its customers, from the purchasing of the raw material to the delivery of the gas for use, including the billing and collecting, and including all interest and depreciation charges, and still keep the charge to 81 per cent of its customers as low as 7 cents per day—only a fraction more than 2 cents per meal. If the average gas rate in the State were cut one-seventh, or somewhat more than 14 per cent, the result to the gas companies would probably be bankruptcy; but to 81 per cent of the gas users of the State the reduction in the cost of living would be only 1 cent per day. A careful study of the data herewith presented will show many other interesting facts in connection with the gas business in this State.

It was stated above that a rate containing a relatively high charge for a small amount of gas could be designed so as to give practically the same revenue as a rate containing a straight service charge. As an illustration of the possibilities along this line an analysis has been made of the business of one of the companies reporting. This company has somewhat more than 6,000 customers and during one month had sales amounting to just a little less than 16,000,000 cu. ft. The present rate of this company is as follows:

Monthly Consumption	Net per M
First 10,000 cu. ft.....	$1.45
Any part of next 20,000 cu. ft.....	1.35
Any part of next 20,000 cu. ft.....	1.20
Any excess over 50,000 cu. ft.....	1.05

Minimum charge $1 per month.

The application of the rate set forth above for the month in question resulted in a gross revenue of $23,368.

If a rate made up of a service charge of 65 cents per month and a charge for gas of $1.20 per thousand for the first 50,000 and $1 for all excess were substituted for the existing rate, then, based on serving the same customers and selling the same amount of gas, the gross revenue would be $23,469.

If a rate as follows were substituted for the present rate the gross revenue would be $22,990:

First 300 cu. ft. or fraction thereof.....	$1.00
Any part of next 1,700 cu. ft....	$1.25 per M
Any part of next 3,000 cu. ft....	1.15 per M
Any part of next 20,000 cu. ft....	1.05 per M
Any part of next 75,000 cu. ft....	0.95 per M
Any excess over 100,000 cu. ft....	0.90 per M

(*Continued on page* 398.)

Reducing the Number of Non-Profitable Consumers

What Hard Work Has Accomplished for One Company

By JACOB B. JONES, Bridgeton, N. J.

"How to Reduce the Number of Non-Profitable Consumers" presents a problem that most gas companies have to contend with, and, being a constant liability, it is one which gives the management much concern.

There is no sure way of determining in advance whether a consumer is going to be profitable or not; and if there were, the gas company could not refuse to make a service connection, particularly if there is an existing main in front of the property.

Therefore the gas company has only one recourse, and that is to make the service so attractive that the consumer will become an asset rather than a liability.

With the appliances at hand and the present favorable attitude of the public toward the utilities, right now is the time to meet this situation.

Many consumers are carried on our ledgers from year to year, and are a constant loss through no particular fault of their own but simply because they have not been fully sold on the idea of gas service.

This paper was presented at the annual conventions of the Pennsylvania and New Jersey gas associations, and created wide discussion. We'll say that company was on the job. What do you say?—Editor.

The company I am connected with supplies gas to 3,600 consumers, and may be said to be fairly representative of conditions found in the average town.

Taking our population of 15,000, we have about the same percentage of homes, stores and factories as found in cities of 100,000 and less.

Along about the year 1900, and continuing until 1910, our company added many new consumers to the lines.

There was a general movement to "put in gas," and this business came to us without much effort on our part.

Business Came Fast

In fact, we were so busy extending mains that about all we did was to stick in a service and set a meter, leaving the rest to the consumer.

It is true that we carried a line of ranges and hot plates, but that was about as far as the service went.

With the advent of the year 1910 we found that the ten previous years had brought us a lot of consumers—but they only used gas for five months out of the year, and our overhead was constant for the full twelve months. Our first step was to secure at least some gas consumption every month in the year. We made a careful record of every consumer on our lines and called on each one personally. The results were truly surprising.

We found that while we had been busy securing new consumers, not much effort had been applied in making our service attractive.

The gas had simply sold itself!

Our consumers had a meter in the cellar and a line running to the shed, where they used a hot plate in the summer; but that was about all.

A "Hurry-Up" Breakfast

The first thing was to get an outlet in the kitchen and have that plate working all the year round, even if it was only to "hurry up" breakfast in the morning.

Once we had the hot plate working every day in the year, our work of displacing it with a gas range was made much easier.

With the gas range established, it was only a step to secure at least one lighting outlet, and our service was gradually extended. It required five years of the hardest kind of effort to get those meters working every month in the year.

Then, in the year 1915, we took 500 cu. ft. per month as our minimum and called upon every consumer who used less than that amount, and on a regular selling campaign raised our sales per customer.

In 1918 we raised our minimum to 1,000 cu. ft. per month and made the same personal calls.

With the beginning of our efforts in 1910 we found that we would have to increase the scope of our work.

Piping houses for lighting outlets was one of the early moves, and for the past several years the gas company has handled all of this work.

To give satisfactory service we felt that the gas company should sell all appliances, and proceeded squarely upon that policy.

Creating a Sentiment

We started out deliberately to create a sentiment that an appliance bought from the gas com-

pany was the very best that could be had, and that our guarantee of service was back of it. And I may say that it has been the sincere desire of every member of our organization to maintain that reputation.

Just the other day the secretary of a well-known stove company in Philadelphia called upon us and, noticing a bright new car lettered in gold "At Your Service Every Hour," remarked, "That is a nice service car; but why call it No. 6?"

When told there were five others of the same type, he expressed surprise that a city of 15,000 could possibly keep six service cars busy. We hardly had the heart to tell him that the new-business department also used two passenger cars of the closed type and brought their prospects by appointment to our showroom; and, most important of all, that every car paid its own way.

A Field for Lighting Business

With the type of lighting fixtures being offered to-day, there is still a wide field for this class of business for the company who is willing to go after it hard.

"Cook with gas" has won its place in the home, and the stove manufacturers are helping to maintain that position by offering the gas companies most attractive and efficient appliances.

Right now—this year—the gas water heater offers a big field for increased consumption.

There is a certain psychology about this water-heater movement, and it is spreading the country over.

A lot of consumers who are now non-profitable are going to forget what Saturday night means and be lifted out of the red-ink columns on the company books—if we go after it.

For certain very definite reasons none of us can hope to entirely eliminate the non-profitable consumer; but all of us can, by good hard work along entirely practical lines, so inspire our working organizations with the idea of attractive gas service that the non-profitable consumer will be the least of our worries.

Water-Gas Tar versus Coal Tar

Different people have different ideas as to what is meant by tar, states W. W. Odell, fuel engineer of the Bureau of Mines, in a technical paper just issued by the bureau. Some regard it as a black, hard "chewable" substance which is shipped in open barrels and used for roofing buildings (in reality this is pitch or asphalt). Others think of it as a mysterious substance from which headache powders, colors, dyes and other chemicals are obtained. Part of the popular misconception regarding the chief uses of coal tar may be due to such definitions of tar as are given in some dictionaries. Although only a small proportion of the tar manufactured is actually used for making drugs, chemicals, flavoring extracts and headache powders, it is not uncommon for dictionary definitions to state that tar is a black viscous liquid from which these and similar products are obtained. According to Webster's Dictionary: "Tar is a thick, brown to black viscous liquid obtained by the destructive distillation of wood, coal, peat and other organic materials, and having a varied composition according to the temperature and material employed in obtaining it."

From this definition one can readily see that there is a possibility of producing an almost endless variety of tars by distilling substances of a nature similar to wood, coal and lignite at various temperatures and under different conditions. It does not follow, however, that in order to understand tars one must have a complete knowledge of the chemical differences and exact chemical nature of each one. Some tars are quite similar in many respects, in spite of the fact that they are made under different conditions and contain varying amounts of the constituents that go to make up tar.

Although it is possible to produce an endless variety of tars, the varieties commonly found on the market in appreciable quantities are few in number and may be listed under the general heading of tars produced as a by-product in the manufacture of combustible gas or coke as follows: Horizontal-retort tar, inclined and vertical retort tar, by-product coke-oven tar, water-gas tar, producer-gas tar, and oil-gas tar.

In fact, a more general classification can be made, and the chief varieties of tar on the market may be classed as: Coal tar (including retort tar and oven tar), water-gas tar, and mixtures of coal tar and water-gas tar.

Water-gas tar has an entirely different origin from coal tar, and, in addition, differs from coal tar both physically and chemically. In appearance, however, it is much the same, except that it is much more fluid; that is, it has the consistency of water or oil. When a small quantity is rubbed between finger and thumb in a thin layer, it appears to be brown to black. Its specific gravity is very nearly the same as that of water, but when free from water the specific gravity may be as high as 1.15. Water-gas tar from small gas plants where the gas is produced intermittently varies more, both in composition and in physical properties, than in the larger plants where operation is continuous. Tars with specific gravities little greater than that of water (1.00) are not separated from water as readily as the heavier tars. Frequently water-gas tars are found that carry considerably more than 50 per cent of water. Such a fluid is, to be specific, an emulsion of tar and water, yet in appearance it is tar. Water-gas tar contains compounds known as paraffins which are not present in coal tar. It is further distinguished from the latter by its not containing any appreciable amount of tar acids. Free carbon is seldom present in amounts greater than 1 to 4 per cent.

Transmission Losses of Natural Gas

R. A. Cattell, natural gas engineer of the Bureau of Mines, is collecting information on orifice meters and other methods being used for the measurement of natural gas. The data are being forwarded to the Gas Measurement Section of the Bureau of Standards, which is co-operating with the Bureau of Mines in developing coefficients for orifice meters at different pressures.

Eastern States Conference Formed

New Jersey and Pennsylvania Associations in Important Move

Under authority of resolutions presented at the 1921 meeting of the New Jersey Gas Association and the Pennsylvania Gas Association, the presidents of the associations appointed joint committees to formulate articles of agreement between the associations, under which a name would be given to the annual joint meeting in effect for some years past and provide what would be practically a single committee to handle all matters connected with this annual joint meeting.

It was also felt that to this combined meeting there should be invited gas companies from the States near Pennsylvania and New Jersey in which there existed no local association. It was felt that the opportunity to develop public interest in the problems of the gas industry through the meetings of such a group should not be lost.

From the Pennsylvania association H. H. Ganser, L. R. Dutton and C. E. Bartlett were appointed.

From the New Jersey association R. R. Young, C. W. Hoy and W. G. Gribbel were appointed.

This committee invited to meet with it R. F. Bonsall, of Baltimore, Md.; J. M. Scott, of Wilmington, Del., and W. R. Rhoades, of Hagerstown, Md.

This committee of nine members at its first meeting elected H. H. Ganser as chairman and Mr. Gribbel as secretary. The committee had six meetings during the year and evolved articles of agreement which were modified by the New Jersey Gas Association directors at a meeting held in Trenton on Dec. 2, 1921, and then subscribed to by the council of the Pennsylvania Gas Association at a meeting held Dec. 6, 1921.

It soon became evident, however, that these articles of agreement failed to completely meet the ideas of several gas companies in New Jersey, and a meeting of representatives of the gas companies of New Jersey was held in Trenton on Jan. 28, 1922, at which suggestions were made for incorporation in the articles of agreement.

A resolution was passed at this meeting to the effect that were these suggestions made part of the articles of agreement, the companies there represented pledged their support without further change. These latter additions were incorporated in the articles of agreement and were subscribed to by the council of the Pennsylvania Gas Association on Feb. 27, 1922.

The development of this matter seems to have approached from two directions—one from the fact that the Pennsylvania and New Jersey State associations have jointly met in April for several years; the other from the gradual growth of the thought that the American Gas Association was reaching such a size in membership and geographic distribution that one large convention each year required such an economy in point of time allotted for the discussion of the various phases of the industry as to prevent an individual from hearing all that he came to hear, due to the fact that he could not be in two or three different section meetings at the same time. This also coupled with the fact that much time and expense were incurred by members coming from points distant from the city in which the convention was held.

The action of the New Jersey and Pennsylvania gas associations in forming the Eastern States Gas Conference is one of the most important in years. The development will be watched with a great deal of interest.—Editor.

As a result of tendencies toward consolidation of State and district gas associations in other parts of the country, the board of directors of the American Gas Association at its last meeting created a committee whose duty it is to make a study of the subject of geographic division of the association. Having these two developments in mind approaching from opposite directions, it seemed natural that something might be done by the Pennsylvania and New Jersey associations to form a nucleus about which a geographic division of the American Gas Association would subsequently be formed, if such became necessary.

It was made clear at an early date that nothing must interfere with the independent identity of the two State associations, and the original articles of agreement covering what has been called the "Eastern States Gas Conference," for want of a better name, have been so molded as to govern only the various matters connected with the annual meetings and to studiously avoid any tendency to minimize the importance of the two associations.

If a criticism is in order it may wisely be said that this whole subject has been taken too much on faith. There must be more friendly opposition of the kind

(*Continued on page* 398.)

As the Journal Views It

Removal Notice

The "American Gas Journal" is now located in the Dodge Building, 53 Park Place, New York City.

Telephone Barclay 6736

Settling the Coal Strike

Exactly as predicted in these columns several weeks ago, plans are being formulated looking toward the end of the coal strike, and it is said that high Government officials have taken the matter in hand and that much of the talk that has been going on has not been put out by those who were accomplishing the real work behind the scenes.

Dispatches which seem to be authentic state that President Harding is now considering a plan that will look toward a settlement of the strike and which will deal with the problem in such a way that there will be no repetition in the future. This plan, it is said, does not contemplate Government supervision in any form.

The officials of the striking miners have been hoping, according to those who are well informed, that the Government would step in, take charge of the situation, and that the coal mines would be placed under close supervision of the Federal authorities. The men pointed to the rate of wage allowed by the Government during the war as an indication of the way in which they would be treated, and accordingly every effort was bent toward this end. That they have not succeeded is indicated in the dispatch which we have referred to.

But, after all, no real suffering has been caused, according to reports of the Government, which stated in a recent bulletin that the falling off in the amount of coal mined was due not to the strikers but to a falling off in demand. The report also stated that should a demand arise, in all probability it could be cared for.

We believe that close observers of the situation will find that the statements made by the AMERICAN GAS JOURNAL will be verified by events. The information on which they have been made has been of the best, and they have been made by those who understood thoroughly what was taking place.

Discussing Rate Making

A report that will have much interest for gas company executives in all parts of the country is the one which will be made to the annual meeting of the Indiana Gas Association to be held next month, and which is printed in full in this issue. This question of rates is a most vexing one, and frequently by a change in system of charging a company is able to weather a condition that ordinarily would force a receivership.

The many decisions that are quoted in the report have been gathered from all parts of the country, and are comprehensive in showing that the problem of rate making is receiving the careful attention of regulatory bodies. The court decisions which have been given on the subject also seem to indicate that the judiciary is cognizant of the confiscatory features of the old-style method of charging.

Gas men will readily agree that there is an undue burden placed on the company by reason of the smaller consumer, whose account requires as much labor on the part of the force of the company as does the larger account. It is a peculiar thing also that much of the difficulty of collection is found with the smaller accounts, for it seems to be a fallacy of people that the smaller bills will be allowed to wait until they have reached a fairly large amount. In many cases this means that a company must maintain a force of collectors who are forced to make repeated calls before a collection is effected.

But, as has been pointed out in the report, this change in the system of charging does not mean that the total income of the company is increased in all cases, but it does mean that there is an adjustment between the burden that is placed on some of the wholesale users as against the slight load carried by the smaller consumer.

Rates and rate making constantly arise, and we are glad that the Indiana association has placed the subject in the hands of such a capable committee, whose recommendations have the advantage of not only having a basis in fact but also of being practical. We congratulate both the committee and the association on the work that has been done.

Carbonization as a Heat Distributing Problem

(*Continued from page* 388.)

Long-Flame Characteristics

A flame can conceivably be prolonged by any means which delays the union of the fuel gas with the oxygen necessary for its complete combustion. In the case of coal gas, this must also be protected from the cracking action of the hot refractory flue walls.

The horizontal-flue coke oven accomplishes both of these functions in a strikingly effective manner by the device of series flues. To a disinterested outsider, concerned only for the development of the gas-making art, it would seem that this feature of this type of carbonizing apparatus has never been adequately presented to the gas fraternity. A German oven designer once stated that he could see that a thirty-foot horizontal flue can be heated, but that he couldn't understand how it was possible, and many gasmen feel that same way about it to-day.

The modern regenerative horizontal-flue coke oven has six heating flues next each oven wall, which traverse the entire length of the oven, substantially thirty feet. During half the regenerative cycle the hot air from one regenerator enters the top flue and travels the entire length of the six flues in all series, passing out the bottom flue into the other regenerator. During the other half-cycle the course is reversed, air entering the bottom flue and leaving the top. During its passage up or down the flue system, this current of air is joined by the fuel gas from five burners, placed in the end communicating openings between the flues, so that the movement of the air carries the gas flame into either the upper or lower flue, according to reversals.

Following the direction of the air, the first gas flame burns in a large excess of air, and is accordingly not able to attain its full flame temperature, i. e., that attained in a theoretically perfect combustion. The second flame then burns in an atmosphere in which a portion of the excess oxygen originally present has been converted to CO_2 by the first flame. This dilution, or pollution, if you prefer, of the atmosphere compensates for the diminution of excess air and keeps the flame temperature about the same throughout the entire process. It also causes delay in the meeting of the second supply of gas with its full quota of oxygen, resulting in a delayed combustion and a prolonged flame. This effect is increased in each succeeding flue until in the last the combustion of the air is just complete.

This system should be seen to appreciate how well it merits the description of long-flame heating. Viewed from the end opposite a burner, the entire flue appears in a tremulous state of active combustion. The gaseous atmosphere is slightly hazy, but never smoky, once the initial adjustments are perfected. No deposition of carbon can take place as there is always an excess of oxygen present until the last burner is reached in the last flue. If carbon should deposit in the last flue on account of careless adjustment of fuel gas supply, upon reversal the last flue immediately becomes the first and is traversed by the current of hot air direct from the regenerator, which constitutes a continuous automatic scurfing or decarbonizing system. Due to the progressive dilution with CO_2, as described, the flame temperature never approaches the theoretical, which for coal gas is well above the fusing point of silica, but a progressive, delayed yielding up of heat at a sufficiently moderated temperature is effected in immediate contact with the heating wall, thus fulfilling the fundamental task of carbonization.

Analyze Rate Situation

(*Continued from page* 393.)

It will be noted that all three rates produce substantially the same revenue. From all the information available it would seem that the last-named rate would have the advantages of being equitable as between customers, would encourage a more liberal use of gas service, would tend to reduce high-bill complaints, and would be cheerfully accepted by the customer.

We have had a number of meetings, have studied practically every report on rates that has been presented to the gas industry in the past three or four years, have corresponded with many companies having actual experience with various forms of rates, and after having considered the rate question from every angle we are unanimously of the opinion that the rate best adapted for general use at this time is a rate made up of a fixed sum for a very small amount of gas plus a rate for gas per thousand considerably lower than the initial charge. We are of the opinion that the initial step should be not more than 400 cu. ft., and that the initial charge should be not less than $1. In no case should the charge be less than $1. If it is made less than this it will constitute discrimination, in that many customers will continue to obtain service at less than cost. We recommend that any gas company in contemplating a *reduction* in rates adopt a rate of this kind, and we further recommend that the proper officers or committees of the Indiana Gas Association present this matter to the Public Service Commission of the State and urge that any adjustments in gas rates that are made in the future be along this line.

Respectfully submitted,

E. Van Arsdel,
E. E. Clay,
J. D. Forrest,
F. B. Tracey,
E. H. Gardner (Chairman).

Eastern States Conference Formed

(*Continued from page* 396.)

that wants to know what it is all about and what are the reasons for it. Do we want it and do we need it? These questions must be asked and answers must be made that satisfy everybody. The whole thought of the conference committee has been to build a structure which would lend itself to searching educational publicity in our own community of the problems with which the industry has had to struggle during the past five years. There are evidences on all sides of a strengthening of favorable public relations, and it would seem that with the prospect of returning adequate revenue there is an opportunity to further establish the merit and usefulness of the industry and its indispensable relation to public welfare.

Owners of Republic Utility Securities in Indiana Protest Against Increase in Public Utility Taxes

The protest against "the easiest way" for tax officials to solve some of their problems in such States as Indiana, has just been carried to Governor Warren T. McCray, the Indiana State Board of Tax Commissioners and the Public Service Commission by a delegation of public utility operators, representing practically all the big utility systems in the State. Rumor has had it for some time in Indiana that the period of "high taxes" was becoming obnoxious to the public. Of course, the public has known that even longer. Probably it is exactly the same in every other State.

Out in Indiana, however, the farming class represents at least 60 per cent of the voting population. Now the politicians do a whole lot for the "voting" population in every State, and if they can determine that one element of that population represents 60 per cent of the total population then it is a pretty safe bet—at least in Indiana—that that element will be met forthwith by the Greeks, bearing gifts—as the saying goes.

Before the utility men "got wise" to the situation out in Indiana, various county and township assessors throughout Indiana had heard the clarion call of the voter, urgling to its mate in many a rural highway and hedge as the springtime drew on apace, or so the story goes that is being told in Indiana now. Therefore, what could the mate of the voter—who is always the politician, or assessor, or vice versa, as they say in Indiana—do but listen to the soft and thrilling urgles. The net result of this Hoosier love-making this spring had been, it was reported to several of the utility operators, that farm lands in Indiana were being valued for taxation purposes at a very general decrease over the former valuations.

Now that was all right, until it fell true that the very same amount of tax money—or more—that had been provided in past years would have to be raised next year out of this year's assessments for ye mate of the urgler to expend in the townships and counties of the State on new jobs for old wheel horses, etc. And so it was that a committee from the Indiana Public Utility Association has just waited on the Indiana Governor, the State Board of Tax Commissioners, which has review powers over local taxing officials, and on the members of the Public Service Commission to point out that "the tendency is toward reducing farm-land valuations and maintaining or increasing the level on which other property is appraised."

The committee told its respective audiences that a 10 per cent reduction of farm-land appraisements would mean a 50 per cent increase of taxes on public utilities and that this would mean higher public utility rates.

Sixty thousand Hoosiers own public utility securities, the committee said, and public utility taxes now take from 8 to 13 per cent of the gross income of all the utilities each year.

Members of the committee included Arthur W. Brady, of Anderson, president of the Union Traction Company; Frank Wampler, of Indianapolis, vice-president of the Indiana Bell Telephone Company; C. L. Kirk, president of the Indianapolis Water Company; S. E. Mulholland, of Fort Wayne, of the Northern Indiana Gas & Electric Company; E. J. Burke: secretary of the Citizens Gas Company, of Indianapolis, and Marshall V. Robb, of Clinton, of the Wabash Valley Electric Company. The committee also represented the Indiana Gas Association, the Indiana Telephone Association, the Indiana Electric Light Association, water companies and interurban railways.

It remains to be seen, said members of the committee, what will happen. Which is a philosophical way of looking at things—and one often used out in Indiana, when the spring mating season is at hand, and an election day only six months away!

Preparation and Uses of Tar Discussed in Paper Issued by U. S. Bureau of Mines

The issuance of Technical Paper 268, "Preparation and Uses of Tar and Its Simple Crude Derivatives," by W. W. Odell, fuel engineer, is announced by the United States Bureau of Mines.

The importance of tar as a commercial product has been emphasized during the past five or six years more than ever before, says the author. In that time, the market for tar and its products fluctuated in an unprecedented way, because of the war and other conditions, with the result that the production of tar and tar products increased greatly. A large proportion of the increase is due to the installation of by-product coke ovens, which are fast replacing the beehive ovens, from which tar and other by-products are not recovered. The increasing demand for steel and the shortage of anthracite coal during the war were a great impetus to the coking industry. In 1920 tar was being produced in greater quantities than ever before, but the entire output was not on the market for sale, as increasingly large quantities were being used for fuel. However, in some localities where the output of tar was small or was of inferior quality—particularly water gas tar—there seemed to be no great demand for the product.

This paper discusses the uses to which some of the various tars are put and shows briefly the usual methods of working up tar into some of its simple or easily prepared derivatives, for which a market can generally be found. Although coal tars are given chief consideration, the properties and characteristics of water gas tar are mentioned, for the reason that this tar is often produced in plants where coal tar is made, the mixed tar being collected and marketed, and for the further reason that the presence of water gas tar in some coal-tar products is specifically interdicted by commercial specifications. This publication is not a handbook on tar distillation, for that subject can hardly be covered adequately in such limited space, but is published by the Bureau of Mines as a general treatise on the utilization of tar.

Technical Paper 268 may be obtained by addressing the Bureau of Mines, Washington, D. C.

First-Aid Work in Oil Fields

The crew of mine-rescue car No. 1 of the Bureau of Mines is engaged in the work of giving first-aid training to the employees of oil-producing companies in the Kern County, Cal., fields. Instruction of first-aid classes for the Standard Oil Company near Bakersfield, Cal., and for the Union Oil Company has recently been completed.

Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company	Issue	Maturity	Apr. 27, 1922 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	106¾	107¼
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	94½	95½
Columbia Gas & Elec. Co.	First 5s	May 1, 1927	92½	93½
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	106	107
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	89¼	90
Consol. Gas Co. of New York	Sec. Conv. 7s	Feb. 1, 1925	114	115
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	75	78
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	91	93
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	97	99
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan. 1, 1928	98¾	99¾
Hudson County Gas Co.	First 5s	Nov. 1, 1949	87	89
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1934	91½	92
Louisville Gas & Elec. Co.	First & Ref. 7s	June 1, 1923	100	101
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	88	90
Milwaukee Gas Light Co.	First 4s	May 1, 1927	92	93
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	91½	92
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	106	108
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	95	95½
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	90	90¾
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	95	96½
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	88	89
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	86	88
Southern California Gas Co.	First 6s	Nov. 1, 1950	96	98
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	90	95
Washington Gas Light Co.	General 5s	Nov. 1, 1960	92¾	93¾
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	87¾	90

Anent Mutual Oil Shale Co.

Capitalized and incorporated for $1,000,000 the Mutual Oil Shale Company, a purely Colorado company, will operate under the patents and licenses of the Rio Blanca Shales Land Company, owners of the Colorado rights of the Brown fractionating retort, and will operate lands near the Index plant, installing the Brown retort.

The officers are J. W. Cook, president; I. J. Cook, first vice-president; A. C. Seitz, second vice-president; W. A. Garrett, third vice-president; F. G. DeWitt, secretary and Charles S. Cook, treasurer.

These officials with Mrs. Ida C. Wilson added, comprise the board of directors.

San Diego Gas & Electric to Buy Coronado Co.

Oakland, Cal.—United Light, Fuel & Power Company has made application to the Railroad Commission for an order authorizing it to sell its electric light and power distribution system in the city of Coronado to the San Diego Consolidated Gas & Electric Company. The price agreed upon between the utilities, subject to the approval of the commission, is given at $100,000 in cash. The sale includes physical property, privileges, franchises and good-will. The San Diego Consolidated is now engaged in selling gas in Coronado, and it seeks to acquire the electric business by this purchase.

Commission Authorizes Bond Issue of $2,000,000

San Francisco, Cal.—The Los Angeles Gas & Electric Corporation has been authorized by the Railroad Commission to issue and sell at not less than 96 per cent of their face value and accrued interest $2,000,000 of 6 per cent twenty-year general and refunding bonds and to use the proceeds to reimburse its treasury for earnings used to pay for plant extensions, additions and betterments.

Among the exhibits offered at the hearing of the application for authority to issue the bonds recently held in this city was a statement showing that, according to utility estimates, it will have to expend in 1922 for additions and betterments to its system $9,259,070.

The Los Angeles Gas & Electric Corporation, distributing gas and electricity in the city of Los Angeles and gas in Pasadena and contiguous territory, is experiencing a tremendous growth in its territory. During the winter just closing its gas send-out broke all previous records. According to officials of the company, the 1922 expenditure program clearly reflects the growth of the territory served by the company.

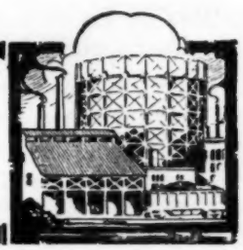
Pays Dividends by Issuing Stocks

Portland, Me.—Authority to issue $230,000 of preferred stock for payment of seven quarterly dividends in arrears on preferred stock was given the Cumberland County Power & Light Company by the Public Utilities Commission. The company operates street car lines, power and light plants.

Colorado Incorporations

The Co-Tex Oil Company; $100,000; home office, Denver. The incorporators are H. M. Rathvon; M. E. Barnhart and Ralph Hartzell.

NEWS OF THE GAS INDUSTRY



N. J. and Pa. Association Hold Annual Gathering

Joint Sessions Bring Out Many Interesting Papers

The Pennsylvania Gas Association and the New Jersey Gas Association held a joint meeting at the Bellevue-Stratford Hotel, Philadelphia, Pa., April 26 and 27. In the forenoon of the first day each association held a separate business meeting for the election of new officers for the ensuing year, appointment of committees, election of new members, etc.

The Pennyslvania Gas Association elected the following new officers: President, Luther Gaston, Lebanon, Pa.; first vice-president, R. B. Hull, Lancaster, Pa.; second vice-president, W. G. Murfit, Newtown, Pa.; secretary and treasurer, George L. Cullen, Harrisburg, Pa.

The New Jersey Gas Association elected the following officers for the ensuing year: President, Jacob Jones; vice-president, L. H. Yetter; secretary and treasurer, H. E. Mason.

New members (individuals) elected to the New Jersey association are: S. Du Bois, Bridgeton, N. J.; Robert F. Crowell, Bridgeton, N. J.; Ralph A. Harris, Bridgeton, N. J.; S. J. Corliss, Public Service Company, Newark; J. H. Potter, Public Service Company, Newark; C. W. Brown, Public Service Company, Newark; Herbert C. Doughty, Hammondton, N. J.; H. M. J. Lloyd, Helme & Hcllhenny, Philadelphia, Pa.; Howard W. Plucker, S. B. Saxton Stone Company, Baltimore, Md.

New company members are New Jersey Gas Company, Coast Gas Company, Bridgeton Gas Light Company, Cape May Oil Company, Atlantic City Gas Company.

New company members of the Pennsylvania association are Waynesboro Gas Company, D. Maurice Mertz, president; Annville & Palmyra Gas Company, L. M. Kline, manager; Jersey Shore Gas Company, S. G. Kinter, manager; Mechanicsburg Gas Company, H. L. King, manager; East Pennsylvania Gas & Electric Company (Bristol), D. A. Elias, manager; Peoples Light Company (Pittston), H. J. Flick, president; Renova Gas Company, T. H. Gilchrist, manager; Philadelphia Suburban Gas & Electric Company (Chester), J. D. Shattuck, manager; Philadelphia Suburban Gas & Electric Company (Pottstown), A. P. McCarthy, manager; Philadelphia Suburban Gas & Electric Company (Phoenixville), H. B. Atkin, manager; Philadelphia Suburban Gas & Electric Company (Coatesville), H. P. Stephenson, manager.

New active members are P. A. Fussellman, Counties Gas & Electric Company, Ardmore, Pa.; A. T. Feiser, Counties Gas & Electric Company, Llanerch, Pa.; C. E. Woomer, Palmyra Gas Company, Palmyra, Pa.; F. C. Chronister, M. I. Barry, J. W. Olsen, W. A. Fink, W. H. German, W. E. Farner, all of Harrisburg Gas Company, Harrisburg, Pa.; C. B. Ranno, Counties Gas & Electric Company, Norristown, Pa.; G. H. Davies, Jersey Shore Gas Company, Jersey Shore, Pa.

The joint meetings started the afternoon session on the 26th. The first paper read was by Edward S. Boyer, superintendent of manufacture, Consumers Gas Company, Reading, Pa., entitled "Modern Boiler Installation and Equipment," in which he described a new installation at Reading.

William H. Halsey, sales manager, Public Service Gas Company, Newark, N. J., read a paper entitled "Why Gas Companies Must Merchandise Gas Consuming Appliances in the Biggest Possible Way."

This paper was discussed very freely by gas company men, appliance dealers and appliance manufacturers. It was agreed that there should be close co-operation between all three in order to insure that the consumer receives an appliance of standard design and efficiency, and the right appliance to perform the work the customer desires satisfactorily. All should assist in educating the public as to the desirability of buying only appliances that have been tested and found to meet standard specifications.

An interesting paper on "Water Heating," was presented by H. H. Ganser, manager of the Counties Gas & Electric Company, Norristown, Pa. Two exhibits were used to emphasize the difference in cost of heating water with coal and gas. One showed the amount of coal required for a given amount of hot water, and the cost per hour for the various amounts of hot water required. An average of one bucket of coal per day used would require over 900 lb. per month. With coal at $12 per ton the cost of coal per month would average $6. The other exhibit showed comparisons of cost of hot water per person, using gas, with various articles of food, and other articles which are being constantly purchased by members of a family. With gas costing $1 per thousand cubic feet the cost of hot water per person would be 3 cents per day.

These exhibits are excellent for window displays, and will be reproduced in an early issue of the JOURNAL.

In the discussion of this paper Mr. Bartlett, of Bartlett & Co., Philadelphia, Pa., made a comparison of cost of heating water with gas and electricity. He stated that 3,500 cu. ft. of gas would heat 2,300 gal. of water, at a cost of $3,50, based on dollar gas. Whereas, an electric water heater that will heat 75 gal. per hour, would cost $27 per month to heat the same amount of water.

Another interesting paper was read by Jacob B. Jones, superintendent, Bridgeton Gas Light Company, Bridgeton, N. J., entitled "How to Reduce the Numbers of Non-Profitable Gas Consumers."

Report of Eastern States Gas Conference Adopted

W. Griffin Gribbel presented the report of the conference committee which was ppointed at the 1921 meeting of the New Jersey Gas Association and the Pennsylvania Gas Association.

The report follows:

This report, including the constitution and by-laws of the Eastern States Gas Conference, was unanimously adopted.

Another resolution instructing the president of the New Jersey Gas Association and the president of the Pennsylvania Gas Association to appoint a committee of seventeen who will meet to nominate the officers and the executive committee of the Eastern States Gas Conference, was adopted.

Another resolution empowered the executive committee of the New Jersey Gas Association and the council of the Pennsylvania Gas Association to elect the first set of officers of the conference was adopted.

There were present several representatives of gas companies in Maryland and Delaware who stated that their companies would be glad to join the conference.

H. F. Frey, of the Allentown-Bethlehem Gas Company, read a paper on "Keeping Customers' Accounts" which explained many new methods adopted by that company to save time and labor in the accounting department.

R. R. Young, new-business agent of the Public Service Gas Company, Newark, N. J., presented a paper explaining the methods adopted to sell stock to consumers through their employees. This company has placed two issues of stock with their consumers, both of which were very successful. Now the company is holding stockholders' meetings in various towns at which a representative of the company tells them about the company's plans and progress.

Fred C. Freeman, vice-president and general manager of the Providence Gas Company, Providence, R. I., delivered a paper on "Public Relations." This company has a school for employees where each one is instructed regarding all departments of the operation of the company. Consumers are invited to visit the plant and the operation of a gas plant explained to them. Talks are made to the students of the high schools and colleges, all kinds of clubs, commercial organizations, etc.

The company has miniature coal gas and water gas machines, and makes both kinds of gas before its audiences. The results of this work in good-will building have been very satisfactory.

The banquet was held Thursday evening, the principal speaker being the Honorable W. D. B. Ainey, chairman of the Pennsylvania Public Service Commission.

The meeting was well attended, and the papers read of a high order.

To Erect Storage Tank

Webster, Bass.—General Manager and Treasurer Albert E. Shaw of the Webster & Southbridge Gas & Electric Company, has applied to the board of selectmen for permission to erect a gas storage tank on Union Street, near the works of the gas and electric company. He said it would cost $50,000. He told the board it would be the means of making a better grade of gas for the consumers.

Declare 2 Per Cent Dividend

San Francisco, Cal.—A 2 per cent dividend on common stock, payable April 15 to stockholders of record March 31, was authorized by the directors of the Central Counties Gas Company following the annual meeting at which was read the annual report of E. W. Hunter, vice-president and general manager. The report is being mailed to stockholders, showing the following interesting comparison of earnings for the years 1919 to 1921, inclusive:

Year Ending—	Gross Earnings	Operating Expenses	Net Earnings
Dec. 31, 1921	$208,018	$163,783	$44,234
Dec. 31, 1920	171,375	147,685	23,690
Dec. 31, 1919	133,124	124,920	8,203

The report points out that in the two-year period, from 1919 to 1921, the gross earnings have increased approximately 31 per cent and net earnings over 400 per cent. After writing off full depreciation for 1921, it is added, a very satisfactory amount was carried to corporate surplus.

Street Lighting Contract of Lowell Renewed

Lowell, Mass.—The city will pay the Lowell Gas Light Company $4.32 less per lamp for its street lighting during the next five years as the result of the contract about to be entered into by Mayor Brown on behalf of the city, and officials of the concern. As there are 1,530 such lamps, it means an annual reduction of $6,609 60 from last year's figures, and for the five-year period a total of $33,048.60. The rate paid last year after the expiration of the contract was $29.12 per lamp. This year the Gas Light company submitted a bid of $28.44, but as a result of several conferences with the mayor a price of $24.80 has been agreed upon. This is somewhat higher than the old contract price, which was fixed about six years ago, when conditions were radically different from what they are to-day.

Twenty-Barrel-a-Day Well Is Brought In

Hornell, N. Y.—Considerable excitement has been experienced in this immediate vicinity recently, due to the fact that Adelbert Austin & Son has drilled in a twenty-barrel-a-day oil well on the Fred Dean farm.

The field discovered is close to the village of Whitesville and property values have soared as a result. Mr. Austin has secured several more closely adjacent leases and plans drilling more wells. He has already let the contract for two more and drilling will be started as soon as equipment can be secured.

Elects Officers

At the organization meeting of the board of directors of the Oklahoma Natural Gas Company the following officers were elected: Harry Heasley, of Emlenton, president; J. V. Ritts, A. W. Leonard and R. C. Sharp, vice-presidents; Leonard C. Ritts, secretary and treasurer; R. S. Callen and C. A. O'Donovan, assistants to secretary and treasurer.

All Directors of Pacific Gas & Electric Are Re-elected

San Francisco, Cal.—The annual meeting of the Pacific Gas & Electric Company embodied no surprises, since the financial statement for the year already has been published. The outgoing directors were re-elected and at a subsequent meeting all the officers, headed by W. E. Creed.

Features of the meeting were the reports of Vice-President and General Manager John A. Britton and Second Vice-President and Treasurer A. F. Hockenbeamer.

Some of the salient points of Britton's report were:

The company's operations now embrace thirty-six counties of northern California, supplying a territory containing an estimated population of 2,000,000. The number of consumers served is 598,969, representing a gain of 29,610 above the total for the preceding year. The annual expenditure in the State for materials, salaries, dividends and bond interests amounts to upwards of $30,000,000. It employs 8,213 men and women.

The total payroll for 1921 was over $13,000,000.

The operating revenues from all departments for the year 1921 totaled $36,933,474 of which 61 per cent was derived from electric sales, 34 per cent from gas sales and the remaining 5 per cent from water, steam and street railway operations. Operating revenues increased $2,457,514 over the year 1920. Operating expenses amounted to $27,348,162, distributed as follows: Labor, $8,464,590; fuel oil, $6,611,716; power purchased, materials and supplies and miscellaneous, $4,456,817; taxes, $3,265,895; rentals for lease of other plant, $950,066; reserve for casualty and uncollectible accounts, $530,000; reserve for depreciation, $3,069,078. Operating expenses increased $1,102,220 over 1920.

The gross expenditures for additions and betterments during 1921, not including the leased properties of the Sierra and San Francisco Power Company, amounted to $18,651,563. Important units of construction work completed last year were: Steam electric plants: Oakland, 16,756 h.-p.; hydro-electric plants: Spring Gap, Tuolumne County, 10,056 h.-p.; Hat Creek, Shasta County (two plants), 33,512 h.-p. One hundred and sixty miles of high-tension transmission line were competed and put into operation.

High pressure gas mains were placed in service from Sacramento to Woodland and from San Jose to Los Gatos. Good progress was made on the first large unit of the Pit River development, which is scheduled for completion on Sept. 1, 1922, and will provide an additional 94,000 h.-p.

The company's nineteen gas plants manufactured over 11,000,000,000 cu. ft. of gas, to distribute which required 3,168 miles of mains. These plants are located in the following cities: San Francisco (two plants), Oakland, San Jose, Fresno, San Rafael, Santa Rosa, Napa, Vallejo, Chico, Grass Valley, Sacramento, Marysville, Colusa, Oroville, Los Gatos, Red Bluff, Redding, Redwood City and Willows.

Operation of New Gasoline Absorption Plant Started

Monroe, La.—The El Dorado Gas Company began operation of its large gasoline absorption plant April 15. It is located about three miles east of El Dorado and cost about $100,000.

The plant will turn out 2,500 bbl. of oil a day which, it is believed, will be increased to 7,000 bbl. later.

The plant extracts about thirty gallons of gasoline from a million feet of gas. The gasoline content of gas in the Monroe is about 400 gal. to the million cubic feet.

Demonstration of Gas Making Given to Students

Utica, N. Y.—In an endeavor to broaden the general knowledge of the community in the process of gas manufacture, a successful demonstration of gas making was given before several hundred students of the science department of the Utica Free Academy, recently by officials of the Utica Gas & Electric Company.

The demonstration, using the company's miniature gas plant, was in charge of Walter J. Cahill, general superintendent of the gas department, assisted by Gordon Bartlett, company chemist. Following the actual demonstration, James E. Cooper, gas engineer, gave an interesting illustrated address on "The Gas Industry."

The Utica Gas & Electric Company feels that the "humanizing element" in the relationship of any public utility with the community should be strengthened at every opportunity.

Extensive Drilling Operations Planned

Chenango Forks, N. Y.—George W. Hilsinger, president of the Tioughnioga Oil, Gas & Mineral Company, Inc., has announced that the company will start oil-drilling operations at an early date.

Acting upon the advice of geologists and experts in oil drilling, operations will first be begun in the Itaska field, in which section the company owns and leases a large territory.

Residents of Binghamton and local interests, in whom control of several thousand acres adjacent to the Itaska field is vested, also plan drilling at an early date.

It has been nearly forty years since any oil drilling has been done in this section. At that time, with every indication of striking a paying flow soon, the drillers employed by a group of local landowners fired the derrick and left. The drilling was abandoned. Local historians have always felt that this mystery could have been easily solved by officials of a large oil company, known at that time to have been antagonistic to private drilling.

Youngsville, N. Y.—The George Topper Company, who are drilling the deep well into the Medina sand at 5,000 ft. depth have met with a serious setback in their activities. After passing the 4,200-ft. depth the tools have been lost in the hole, caused by the cable parting. Considerable difficulty is being encountered in regaining the equipment as the total weight of the apparatus approximates 6,500 lb.

Small pockets of gas have been reached in this section but nothing of commercial value has been uncovered to date.

City to Benefit by Rate Reduction

Portland, Me.—The lighting committee of the city government met last week and signed a contract with the Portland Gas Lighting Company for one year as of Feb. 1. The contract is somewhat more advantageous to the city than that of last year. A clause in it provides for further charge under the reduction granted by the Public Utilities Commission, which is to become effective May 1, which will mean still more of a saving to the city on its gas light bill.

"Old-Timers" Honored at Meeting

Elmira, N. Y.—Sixty-seven "old-timers," employees of the Elmira Water, Light & Railroad Company, were recently entertained by the company, at a meeting held in their honor at Rorick's Glen.

President and General Manager of the company F. H. Hill was host to the gathering and in behalf of the company presented to all employees of ten years or over, continuous service, a token of appreciation.

It is planned to have service buttons, designed to show years of association with the company provided for the members of the "Old-Timers Club."

John Gilmore, who has been with the company thirty-six years, was the patriarch of the assemblage and responded to "How It Feels to Be an Old-Timer."

Monroe Fields Survey Shows Gas Can Be Piped to New Orleans for 80 Cents

New Orleans, La.—Natural gas can be piped to New Orleans from the Monroe fields at a cost of about $7,500,000, and can be distributed for domestic consumption at a maximum rate of 80 cents to $1 per thousand cubic feet. This is the finding of the survey just completed by the minerals and engineering division of the State Department of Conservation, made public by Governor Parker to whom the report was addressed.

These conclusions are arrived at in the survey:

"1. Ample gas deposits exist in the Monroe field, but the State should eliminate the carbon black plants and other channels of waste.

"2. A sixteen-inch pipe line via Natchez, 275 miles long, would cost about $7,500,000, and could deliver 15,000,000 ft. daily in New Orleans.

"3. The gas would cost, delivered to the consumer, 80 cents to $1 per thousand cubic feet."

The survey, which was made under the direction of Ben K. Stroud, supervisor of the minerals division, and Frank T. Payne, engineer of the Conservation Department, exhaustively treats the subject of piping gas to New Orleans. Governor Parker has ordered 500 copies of the report printed for the Assembly.

It considers three possible routes for the pipe line, but the engineers drawing the report express preference for the route via Natchez, stating that the Mississippi River at Natchez Island averages forty feet in depth, offering a desirable place for crossing.

The report gives the total population of the cities that would be served by that route at 453,294, including New Orleans. It sets the cost of the sixteen-inch pipe line at $7,514,619, and the annual cost of administration, including interest at 8 per cent, amortization at 12½ per cent, and all expenses of maintenance at $2,261,750. It estimates the cost of natural gas delivered to the pipe line at Monroe from the wells, at 8 cents per thousand cubic feet.

Probable annual consumption is estimated as follows:

Domestic uses at New Orleans, 4,200,000,000 cu. ft.; other towns 450,000,000 cu. ft.; industrial, 1,825,000,000; a grand total of 6,475,000,000 cu. ft. a year.

N. Y. State Gas & Electric Corp. Elects New Officers

Ithaca, N. Y.—The New York State Gas & Electric Corporation, which owns and operates gas and electric plants in the cities of Ithaca, Cortland, Norwich, Oneonta and Sidney, and furnishes gas and electric service to these communities as well as the towns and villages located in this immediate territory, elected the following officers recently: President, S. J. Magee; vice-president, G. A. Strain; secretary-treasurer, O. E. Wasser.

Mr. Magee was formerly vice-president of the company, while Mr. Strain was general superintendent, in charge of the operations of the various plants and Mr. Wasser was auditor, in charge of the accounting.

J. I. Mange, the former president of the New York State Gas & Electric Corporation, has resigned in order that he might devote his entire time to the affairs of the J. G. White Management Corporation, of New York City, of which he is vice-president in active charge of public utility matters.

Mr. Magee has for the past several years been located in New York, but will move his family to Ithaca, N. Y., the latter part of May. It is the expectation that all executive administration of the properties in question will in the future be conducted from the Ithaca office.

Rebuilding Gas Plant

Some months ago the gas plant at Carroll, Iowa, was forced to shut down. Several of the leading citizens, however, determined that the town should no longer be without gas, and have recently placed contract with the Western Gas Construction Company to build them a modern carbureted water gas set, together with the coke hoist, bucket and high-pressure blower required for same.

Work on the new contract is being pushed vigorously, as the people in Carroll are anxious to have gas service restored as soon as possible.

Purifier for Sheboygan

In line with the general construction policy of the Sheboygan Gas Light Company, of Sheboygan, Wis., for their improvements in 1922, contract has recently been placed for a twenty-four foot diameter steel purifier with extension to the steel hoisting frame of the present purifier construction.

Contract for the new purifier has been placed with the Western Gas Construction Company.

Elect Officers of Utica G. & E. Company

Utica, N. Y.—At the recent annual meeting the following officers of the Utica Gas & Electric Company were elected: President and general manager, Frank M. Tait; vice-president and associate general manager, F. B. Steele; vice-president, M. J. Brayton; secretary and treasurer, George H. Stack; assistant secretaries, W. C. Birmingham, W. J. Duffy; assistant treasurer, John F. Carney; directors, F. M. Tait, J. C. Brady, S. A. Beardsley, W. E. Lewis, Charles B. Rogers, William I. Taber, William T. Baker, Frank B. Steele and M. J. Brayton.

Comanche Gas Rate Extended

The Comanche Gas Company, of Comanche, Stephens County, Iowa, has secured an extension until Nov. 1, of the rate schedule established Jan. 1, and which expired by terms April 1. The extension was granted with the definite understanding that the schedule will be reduced Nov. 1, provided the present gas supply continues to be available. The present rate is 60 cents for 1,000 cu. ft., with 10 per cent discount on prompt payment of bills.

Personal Notes

THE WEBSTER & SOUTHBRIDGE GAS & ELECTRIC COMPANY, Webster, Mass., has been granted a permit by the board of selectmen, to relocate poles on South Main Street.

GEORGE R. STAPLETON, forty-nine years old, and for the past seventeen years connected with the Buck Range Company, Denver, Col., is dead.

JOHN P. MITCHELL, of Maple Street, Sterling, Mass., who was recently appointed manager of the municipal light plant, has left for Nova Scotia, for a vacation, upon the advice of his physician. Harrison W. Rugg, the new member of the board of light commissioners this year, will attend to the bookkeeping department, while Lionel Wilder, Mr. Mitchell's partner in business, will look after the mechanical details until Mr. Mitchell's return from Canada.

THE MASSACHUSETTS GAS COMPANIES has declared a dividend of 1¾ per cent upon the common shares of the corporation, payable May 1, to stockholders of record on April 15. E. N. Wrightington is treasurer of the concern.

THE COAST VALLEYS GAS & ELECTRIC COMPANY has recently issued a block of 6 per cent cumulative preferred stock which is being offered to the public by Hunter, Dulin & Co. at 86 to yield 7 per cent. The stock is callable at 110 and is exempt from personal property taxes in California. There is $100,000 par value of this preferred stock outstanding. Dividend requirements were earned 2.333 times last year.

THE PACIFIC GAS & ELECTRIC CORPORATION, one of the hydro-electric and gas distributing utilities in the West, has declared regular quarterly $1.25 common dividend.

L. J. FRENTZ, who until recently has been connected with the sales department of the New York State Gas & Electric Company, at Ithaca, N. Y., has of late formed an association with the Northern New York Utilities, Inc., of Watertown, N. Y., and will have charge of the sales department. Among Mr. Frentz's first duties in his new position was the directing of an intensive gas range demonstration and selling campaign held early in April, and the company has just completed a special sales effort on automatic tank and water heaters.

DR. ALEX. C. HUMPHREYS, on and after May 1, 1922, will be located at Stevens Institute of Technology, Hoboken, N. J. Communications should be sent there to the president's office. The telephone number is Hoboken 484.

THE REPUBLIC LIGHT, HEAT & POWER COMPANY, distributing gas in Dunkirk and throughout western New York State, have a large acreage under lease in the newly developed Abbey-Forestville natural gas field and plan to start drilling several wells as soon as equipment can be gotten on the ground.

THE EASTERN CONNECTICUT POWER COMPANY has increased its capital to $4,000,000 by the issuing of 5,000 additional shares of stock, each of the value of $100.

THE POLICE have received word that the body of a man believed to be that of James Higgins, of Fitchburg, connected with the Fitchburg Light & Gas Company, was found in a creek in an outlying district of Chicago, Ill. The man hired a taxicab and drove to the creek, where he drowned himself, according to the police. A book bearing the name of "Higgins" was found in his pocket, but the vest which he wore bore the name of Michael J. Sullivan, 12 Adams Street, Fitchburg.

JOHN C. MILLER, sales manager for the Oklahoma Producing & Refining Corporation, has resigned his position with that organization, according to an announcement at the company's offices in Tulsa, Okla. Although he has made no statement regarding his future plans, it is understood that he will join an Eastern firm within a short time. Mr. Miller is succeeded by D. L. Gilland, former head of the distributing division of the same corporation. Mr Gilland has served the Oklahoma Producing & Refining Corporation, since Feb. 1, 1917. Prior to that time he was with the Pierce Oil Corporation for eleven years.

Reynolds Is Secretary of the Western Refiners

Chicago, Ill.—John D. Reynolds, formerly secretary and counsel of the American Independent Petroleum Association has been appointed secretary and counsel of the Western Petroleum Refiners Association, succeeding H. G. James. Mr. James is to give all his time to his oil interests.

At the same time Harry Birmingham, formerly traffic manager of the Sinclair Refining Company, was appointed traffic manager and A. T. Sindel rate expert. The traffic department will be moved from Chicago to Kansas City at once. The appointments were decided upon at a meeting of the board of directors at the association headquarters at Kansas City March 24.

While Mr. Reynolds states that he has as yet formed no definite plans, the policy during the coming year will be to take the association to the refiner and actively work to restore those refiners who have been put out of business by the trying times, back on their feet.

Since the American Independent Petroleum Association was merged last fall with the Independent Oil Men's Association to form the present national jobbers association. Mr. Reynolds has been practising law and has been retained as counsel for the National Petroleum Marketers Association. He resigns this position to take the leadership of the refiners' association.

At the meeting of the board of directors of the refiners, association at Kansas City seven members of the board were chosen as an executive committee to meet at the call of the president on short notice when any important emergency might arise. W. D. Richardson, president of the Meridian Petroleum Corporation, Kansas City, and former president of the refiners' association, was named chairman of the executive committee. The other members are E. R. Perry, Cosden & Co., Tulsa; P. M. Miskell, Empire Refineries, Inc., Tulsa; E. E. Schock, Indiahoma Refining Company, St. Louis; F. A. Pielsticker, Midland Refining Company, El Dorado, Kan.; E. W. Goebel. Kansas City Refining Company, Kansas City, and Elliott Jones, Elliott Jones & Co., San Antonio, Texas.

Natural Gas Situation to Be Controlled by Appointive Commission

Bridgeburg, Ont.—The Minister of Mines, Harry Mills, has approved the plan advanced by the Bridgeburg council and committees from other adjacent towns, that the control of the natural gas situation be placed in the hands of an appointive commission of three, instead of having the entire authority governing natural gas distribution and service vested in one man as at present. Ontario municipalities have received assurance from Mr. Mills that immediate legislation toward this end will be promulgated.

Officials of the Provincial Natural Gas & Fuel Company, of Niagara Falls, Ont., who, under the action of the gas referee, have obtained an increase from 50 cents per thousand cubic feet, the franchise rate, to 75 cents per thousand cubic feet, are confident, however, that no action of a newly appointed Gas Commission could be held as nullifying the ruling of the referee.

Additions and Improvements to Binghamton Gas Works to Cost $100,000

Binghamton, N. Y.—Charles E. Bennett, vice-president and general manager of the Binghamton Gas Works, Binghamton, N. Y., has announced additions and alterations to the company's plant, and installation of new gas manufacturing equipment that will entail an expenditure of nearly $100,000.

A building that adjoins the present plant in Court Street has been obtained and after extensive remodeling has been completed will be utilized to house a new water gas machine as well as a booster pump and station meter.

It is planned to erect new building for boiler and superheater equipment. The addition of this new equipment and the rearrangement of the present apparatus will increase the output of the plant to nearly double its present capacity.

New Manufactured Gas Plant for Kokomo

The completion by next Nov. 1 of a new artificial gas plant for the city of Kokomo, Ind., which has become an unusually heavy user of gas for industrial purposes, was prophesied following a "gentlemen's agreement" on service rates just entered into between B. C. Moon, mayor of Kokomo, seven members of the Kokomo city council, and C. W. Munroe, vice-president of the Kokomo Gas & Fuel Company, of which the Peoples Gas Light & Coke Company, of Chicago, is the parent company.

At present a gas supply shortage threatens Kokomo. The basis of the rate agreement is a graduated schedule of service rates ranging from a net charge of $1.35 per thousand cubic feet to the small consumer down to 75 cents a thousand cubic feet to large users of fuel. A contract was to be drawn up before the last of April after which the gas company and the city authorities planned to go before the Public Service Commission of Indiana for approval of the agreement. Consummation of the agreement is expected to consume less than thirty days, after which work will be started immediately on the erection of a gas plant, Mr Munroe said, according to news from Kokomo, just received by authorities at Indianapolis.

Mr. Moon also was quoted as saying it was reasonable to believe that the company should be able to supply fuel from the new plant by Nov. 1, 1922. Much complaint as to the lack of supply of the company in Kokomo has been heard recently, the supply there being partly artificial and partly natural. The artificial gas has been piped from Chicago and several times the mains from Chicago have been found to contain leaks, with consequent shortage of the fuel at the terminal.

Stockholders Elect Officers and Directors

Syracuse, N. Y.—Recent annual stockholders election of the Lux Oil Company, 511 S. A. & K. Building, Syracuse, N. Y., the following directors were elected: Charles A. Lux, P. C. Dunning and E. Goldstein of Syracuse, Daniel E. Lux and J. H. Lux of Clyde, N. Y., Willard H. Tappan and J. F. Williams of Baldwinsville. At the meeting of the directors following the stockholders' meeting the following officers were elected: President, Charles A. Lux; vice-president, Willard H. Tappan; treasurer, J. F. Williams; secretary, Daniel E. Lux.

Bowling Matches

Leominster, Mass.—The Clinton Gas Company took all four points from the Leominster Gas Company, in a special bowling match on the Hub alleys last week. The totals were: Clinton, 410, 412, 420, 1,242; Leominster, 347, 391, 406, 1,134. The Clinton line up was Walsh, Freel, Casey, Jennings, Bigeby; Leominster, Wedge, Trembly, Whittle, Watkins and Ashton.

Leominster, Mass.—There were two bowling matches rolled on the Hub alleys last week, between the Leominster Gas Company and the Arlington Gas Company, the locals winning the first match and the visitors evened the matches in the second contest. In the first match Leominster defeated Arlington, 1,385 pins to 1,294 pins, and in the second match Arlington defeated Leominster 1,277 pins to 1,267 pins.

Pittsfield Coal Gas Co. Is to Occupy Park Building

Pittsfield, Mass.—The Pittsfield Coal Gas Company has started work upon alterations to the Park Building, corner of South Street and Bank Row, which it recently purchased. All the first floor will be used for salesrooms and offices and the second floor will be used exclusively as office space. Entrance will be on South Street. The first floor will be lowered to the sidewalk level, and both the South Street and Bank Row fronts will be improved. Architects Harding & Seaver drew the plans for the changes and D. Herbert Pike has been granted the general contract. The company has bought four lots of land from the Backus tract on East Street. It is planned to build garage and storage structures on the premises. The price paid is said to have been $6,000.

To Improve Service and Reduce Rates

Franklin, N. H.—John P. Proctor, treasurer and general manager of the Franklin Light & Power Company, states that the company has completed arrangements to install new gas-making apparatus at its plant, and to make various improvements in the service which will enable it to furnish gas to customers in Franklin at a material reduction from the present gas rates. The company hopes to be able to furnish the new service to take effect June 1.

Conservation of Natural Gas Supply Urged by Louisville Manager

Louisville, Ky.—Donald McDonald, vice-president and general manager of the Louisville Gas & Electric Company, speaking before the Exchange Club of Louisville, said that no city could be prosperous unless served by prosperous public utilities. Mr. McDonald's subject was "Our Great Public Utilities," and he emphasized the value to the community of dealing with utilities in a spirit of fairness. He urged the necessity of conserving our natural gas supply, and cited as one of the chief causes of waste the manufacture of carbon black. "The carbon black factories in this State to-day are burning up enough gas to supply 100,000 homes," he said: "the use of natural gas for this purpose should be prohibited if we are to insure a supply of natural gas for domestic purposes in the future."

Experts to Present Papers at Natural Gas Association Convention

As the time approaches for the annual convention of the Natural Gas Association of America, at Kansas City, Mo., May 15, 16, 17 and 18, much interest has been aroused by the number of exhibits by the members of the Supply Men's Association, as well as by the fine program arranged by Secretary William B. Way. Nearly every inch of space in the exhibition hall has been rented by supply men throughout the country, and it is known now that this part of the convention will be a huge success.

As to the convention proper, nothing of interest to natural gas men has been omitted in the preparing of the program and the appointment of experts to read the papers and lead the debates in the subjects of deep importance to men in the industry. Four papers will be read, two of them at one of the sessions, and one at each of the other two.

Henry Morris, of the Dallas Gas Company, Dallas, Texas, will read a paper entitled "What the Natural Gas Companies Are Doing to Help the Consumer Get the Greatest Value from His Natural Gas Service." This it is hoped will be copied in great part by the newspapers throughout the gas-consuming districts, as it is of as much importance to the consumer as to the members of the association.

"The Indeterminate Franchise" will be the subject of a paper read by J. W. Dana, of the Kansas City Gas Company, and the well-known ability of Mr. Dana in dealing with this and any other technical subject will mean that he will hold the interest of the convention while on the floor, and after he is through his hearers will know a lot more than they did before.

G. C. Maxwell, formerly secretary of the Public Utility Commission of Ohio, who has been delivering talks throughout the State of Ohio on the subject of natural gas, has prepared a paper on the result of his experiences therefrom, and there is no gainsaying that many new things will be brought out. Contact with the general public by the manufacturer or producer always brings out new points in the industry, and Mr. Maxwell will be more than entertaining: he will be instructive.

H. C. Cooper, chief engineer of the Hope Natural Gas Company and affiliated companies, will have a paper on "Standardization," with which he is very familiar, and he also will instruct very broadly.

To Increase Facilities for the Manufacture of Gas

Canandaigua, N. Y.—Manager Thomas M. Cougevan of the Rochester Gas & Electric Corporation's Canandaigua office has announced that the corporation plans extensive increases in gas manufacturing facilities at the Canandaigua gas plant.

Manager Cougevan further states that the contemplated installation of the new and improved equipment will be sufficient to meet the increasing gas demands of the community for some time to come.

Gas Report Shows 8 Per Cent Earnings

Milwaukee, Wis.—Analysis of the report of the Milwaukee Gas Light Company by the city attorney's department shows that the closing months of 1921 and the early months of 1922 show earnings which will exceed 8 per cent by about $250,000, according to John M. Niven, city attorney, who announced that the rate commission will be asked to restore the old rate of 75 cents per 1,000 cu. ft.

Bill Signed Authorizing Below Par Stock and Bond Issues

Boston, Mass.—Governor Channing M. Cox signed the bills providing that gas, electric and water companies may issue bonds at less than par as such a rate of interest as the State Public Utilities Commission shall approve, and that when a gas or electric company increases its capital stock, and such new stock cannot be disposed of at or above par, the Public Utilities Commission may authorize the sale at less than par.

Navy Medal Is Received by General Harries

In appreciation of his close cooperation with the naval forces of the United States during the World War, General George H. Harries, vice-president of H. M. Byllesby & Co., has been decorated with the Navy Distinguished Service Medal. The presentation was made April 12, by Secretary of the Navy Edwin Denby, at the Navy Department in Washington. Only nine officers of the army and navy, including General Harries, have received this decoration for distinguished services from both branches of the service.

The citation accompanying the medal reads as follows:

"For distinguished service during the World War in a position of high responsibility when, as commander, U. S. Army Base Section Five, Brest, France, he by his marked executive ability, broad understanding of our problems, unfailing courtesy and a constant willingness to co-operate, materially assisted the navy in its arduous work on the French coast."

General Harries is now on the reserve officers' list, after many years in the active military service of the nation. During the World War he was in charge of the Fifty-ninth Depot Brigade of the Thirty-fourth Division, at Deming, N. M.; he then commanded the One Hundred and Eighty-sixth Infantry Brigade at Camp Jackson, and took this organization overseas. He was commander of Base Section Five at Brest, and directed all construction work at that port. Following the signing of the armistice he was placed in command of the Eighty-seventh Division, and was relieved of that charge to become chief of the United States military mission in which capacity he was the first American officer to enter Berlin after the war.

Natural Gas Findings in Texas

Latest reports from the Texas fields say that the Bell No. 1, in the vicinity of Pecos, is flowing at the rate of 8,000,000 to 10,000,000 cu. ft. daily.

On the Harrell tract eight miles north of Eastland a well yielding an estimated 150,000,000 cu. ft. of gas is reported and so great is the roar and odor that the farmers for miles around have threatened legal action if the promoters do not quell the noise and odor.

At Post, Texas, is in the Panhandle country, they have struck so much gas it is blowing the tools out of the hole. No estimate given.

At Currie, Texas, the Snowden-McSweeney well, a mile to the north of the city is producing 15,000,000 cu. ft. of gas.

What a pity that these excellent wells are far removed from any city of consequence, still there is money in carbon black and if there is no other use for the gas it should be used for the carbon black industry and not allowed to go to waste. No doubt, there will be gasoline distilled therefrom if the drillers will think clearly and not run wild on oil.

Pacific Gas & Electric to Erect New Building

San Francisco, Cal.—Erection of the Pacific Gas & Electric Company, at a cost of $1,750,000, will be started soon. The site for the structure was recently purchased at a cost of $500,000. It will adjoin the new sixteen-story Matson Navigation Company building now being erected on lower Market Street. The height and style of the new structure have not yet been decided upon.

Byllesby 10-Payment Booklet

The second edition of "Income Building on the Byllesby Ten-Payment Plan" has just been published. It contains a short resume of the activities of the H. M. Byllesby & Co. organization, and explains the principles and summarizes the advantages of purchasing securities on the partial payment plan. Copies will be forwarded to inquirers upon request.

Allows Service Charge

Boston, Mass.—The Department of Public Utilities has authorized the Malden & Melrose Gas Light Company, to charge its customers at the rate of 12½ cents per 100 cu. ft. for gas and a regular monthly assessment of 35 cents as a service charge. The service charge permitted by the department is the first to be allowed to any company of any considerable size. It is said that the decision will have a bearing upon the application of a number of other gas companies for authority to put in a service charge. The Worcester Gas Light Company has petitioned the commission for authority to establish a 50-cent service charge in Worcester. Chairman Attwill of the commission has indicated that the commission might be willing to authorize a lower amount for a service charge, and it is expected the decision on the Worcester case will be similar to the Malden & Melrose decision. The Malden & Melrose Gas Company petitioned for authority to impose a service charge of 50 cents and sell gas at the rate of 12 cents a hundred. The department scales down the service charge and allows the company an offset of one-half a cent more in the sale of its product. Commissioner Everett E. Stone dissents from the decision of the remainder of the commission. He says the service charge works out in a reduction in the price of gas to the consumer of but 7½ cents per thousand cubic feet "when the cost of making the gas has been reduced at least 22 cents. This company," he adds, "has gradually raised its rates for gas from 90 cents in 1917 to $1.50 per thousand cubic feet in 1920 because of the large increase in the cost of labor and material that entered into the manufacture of gas, and the customers accepted the scales with little objection because they felt the increases were justified. Now that the costs of the company are substantially reduced, the consumers are entitled to a more comparable reduction in the price of gas. I believe the consumers are entitled to a greater reduction in the price of gas and that without further unnecessary delay." The majority report expressed the opinion that customers using little or no gas, but desiring to have the lines connected with the company's mains not only contribute little to the company's revenue but do not contribute enough to cover the company's expense incurred solely for them. The question determined, says the report, was not one primarily between the company and its customers but rather between the customers themselves as to the fairest method of raising revenue for the successful operation of the company.

Rights Given Utility Company

Providence, R. I.—The Rhode Island House of Representatives passed the bill giving to the Blackstone Valley Gas & Electric Company the right of eminent domain in Providence County outside of Providence and East Providence. A motion made by Representative McCoy of Pawtucket, Democrat, was defeated. Mr. McCoy said there were objections to the bill which he wanted to see "ironed out" in committee. His motion was opposed by Representative Talcott of Providence, member of the corporations committee, which reported the bill. Mr. Talcott said there was no opposition to the bill at a public hearing, except from East Providence. Representative Herrick of Woonsocket, Democrat, said his city opposed the act. Representative Condon of Central Falls, Democrat, also favored recommittal. Both men made motions to except their cities from provisions of the act, but failed. The bill finally passed on a roll call, 68 to 26.

Has New Position

Woonsocket, R. I.—Herman J. Pettingill, Jr., sales manager of the Blackstone Valley Gas & Electric Company, has accepted a position in the securities department of the Boston, Mass., offices of Stone & Webster, Inc., brokers for public utilities stocks and bonds. He will commence his new duties May 1. Mr. Pettingill has been associated with the Blackstone Valley Gas & Electric Company for ten years, having been located in Woonsocket for eight years and in Pawtucket for two years. His successor has not been appointed.

Contract Approved

Boston, Mass.—Mayor James Curley has approved of this city contract: With National Electric Construction & Supply Company, lowest bidder, for installing and completing gas and electrical systems in the Prince-District Elementary School, $6,475.